

Classification of Urinary tract obstruction:

- a) Etiology: 1-Congenital 2-Acquired
 b) Level of Obstruction: 1-Upper (ureter & above) 2-Lower / Infra-vesical (urethra & bladder neck)
 c) Duration: 1-Acute 2-Chronic d) Degree: 1-Partial 2-Complete

Upper Urinary Tract Obstruction:

Etiology:

a) Mural (wall):

- 1-Stricture Ureter: by Bilharziasis, T.B., iatrogenic (in urologic or gynecologic procedure)
 2-Tumors: *1ary: arising from the ureter
 *2ary: Invasion of ureteric orifice by bladder, prostatic or vaginal cancer
 3-Congenital narrowing: -Ureteropelvic junction obstruction -Ureterovascular junction obstruction

b) Intramural (Intraluminal)

- 1-Stones 2-Blood clot (esp. organized ones) 3-Heavy fungal infections (fungal ball)
 4-Foreign body (e.g. neglected stent as Double J → encrustations)
 5-Urothelial tumors (e.g. sloughed parts of transitional cell papilloma of renal pelvis)

c) Extramural:

- 1-Retroperitoneal mass (e.g. Enlarged LN, Lymphoma, hematoma) 2-Retroperitoneal Fibrosis
 3-Gavid Uterus (pressure more on the right side)

Effect of Obstruction:

1-On Ureter: -Distal to obstruction → normal

- Proximal to obstruction ► at first, **Hypertrophy** of the muscles of the wall, then **Exhaustion** →
Dilatation → **Elongation** → **Ureter Tortuosity & Kinking** → **Fibrous bands formation** → **2^{ary} obstruction**

2-On Renal Pelvi-calyceal system:

a-↑Pressure → Dilatation → Pelvic hydronephrosis

b-On Calyces (Hydronephrosis):

- **Types of Renal pelvis: 1-Extrarenal (20%) 2-Intrarenal (80%)

3-On Parenchyma: Dilatation → Atrophy → Function loss

- **Intrarenal dilatation leads to atrophy of the parenchyma more rapid than extrarenal so function loss occurs late in extrarenal dilation (as it dilates on the expense of peripelvic fat not the parenchyma)

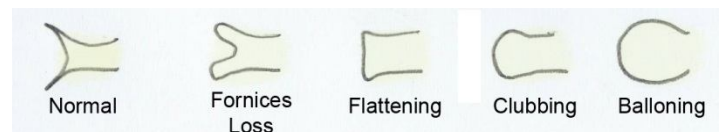
Hydronephrosis:

Def: Chronic aseptic dilatation of pelvi-calyceal system due to incomplete (partial) ureteric obstruction

Degree: Mild, Moderate, Severe

1-According to Calyceal dilatation (by IVU):

- a-Loss of fornices b-Loss of concavity
 c-Clubbing (convex) d-Balloning



2-According to Parenchymal thickness (by US):

Normal Parenchyma is 2 cm thick, at late stages of hydronephrosis it may reach paper-cell (1 ml)

- **Imaging by IVU depends on Kidney function, so if there is deterioration of function, the dye won't be excreted into the ureter so It won't appear

- **Infection on top of hydronephrosis → **Infected hydronephrosis (NOT Pyonephrosis)**

	Infected Hydronephrosis	Pyonephrosis
How happens?	Obstruction then Infection	Both at same time
Affection	Pelvi-Calyceal system only	Pelvi-Calyceal + Parenchyma + Perinephric tissue (3 Stratal affection)
Symptoms	High grade fever, severe pain	Low grade fever, mild pain
Examination	Huge Swelling + Severe Tenderness	Just palpable mass , not tender
TTT	PCN + Further Kidney assessment	Nephrectomy

**** In Pyonephrosis: Fibrosis → no spread of infection so patient not toxic, Low grade fever & mild pain**

**** PCN (Percutaneous Nephrostomy): in order to drain the pus**

Treatment: (TTT of the cause) e.g.

***Remove Stones**

***Stricture**→ -Upper/Middle→ Resection & anastomosis

-Lower → Ureterovesical re-implantation (Ureteroneocystostomy)

***Congenital: Ureteropelvic junction obstruction**→ Pyeloplasty

